



Convention Date (Germany): July 2, 1929.

354,942

Application Date (in United Kingdom): July 1, 1930. No. 19,960/30.

Complete Accepted: Aug. 20, 1931.

COMPLETE SPECIFICATION.

Process for Improving the Taste of, and for Removing Poisonous Matter from, Infusions of Tea and Coffee.

I, **WILLY STELKENS**, of Hansaring, 47, Cologne; Germany, a Citizen of the German Republic, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to a process for improving the taste of, and for removing poisonous matter from, infusions of tea and coffee.

The removal of poisons from infusions of coffee and tea by treating them with solid adsorbents as for example activated carbon has already been carried out by bringing the hot aqueous infusion into contact with interconnected layers of the adsorbent and filtering the infusion through such a layer. During the filtration of an infusion of coffee through a layer of activated carbon the latter extracts the caffeine and the roasting poisons to a sufficient extent from the infusion only by maintaining certain conditions relating to heat and duration of the filtering operation.

The surprising observation has now been made that a considerable improvement in taste with simultaneous removal of poisons from infusions of coffee and tea can be effected very advantageously if the substances, namely the ground coffee or tea, and the adsorption agent are intimately mixed with one another and then brewed with boiling water. The improvement in taste of the infusion is due to the fact that during intimate mixture of the tea or ground coffee with the adsorption agent, such as activated carbon or even activated silicic acid, the volatile fragrant substances are deposited on the latter almost instantly. During the subsequent brewing of this mixture with boiling water the adsorbed fragrant and aromatic substances are gradually given off to the hot water and those constituents of the infusion which are poisonous and distasteful and which have gone into solution in the hot water are taken up by the adsorbent and thereby withdrawn from the infusion.

It is known that during the brewing of coffee the fragrant substances in con-

sequence of their volatility with water vapour disappear very quickly in considerable quantities and therefore when the infusion is ready to drink they are to a large extent not present. The step according to which the fragrant substances are maintained in the infusion, by mixing the ground coffee or tea with activated carbon or silicic acid before the preparation of the infusion and in this way binding them to these additions, is a new inventive thought. Simultaneously with the fixing of the aromatic substances in the prepared infusion a particularly large withdrawal of the distasteful constituents is effected according to the present process by a special method of procedure consisting in brewing the mixture of ground coffee and adsorbent firstly with a smaller quantity of boiling water and then further diluting. If during the brewing of the mixture of ground coffee and adsorbent at first small quantities of boiling water, relatively to the substances to be separated, are used then the substances re-act in maximum concentration with the added adsorbent and in this way there is effected a much greater separation of caffeine and the other distasteful constituents on to the adsorbent which is finely distributed in the mass.

The adsorbents chosen for adding to the mixture are selected for the purpose of obtaining a fine distribution in the smallest possible particles.

It is recommended that no powder be added so that the adsorbent will not form an emulsion with the infusion and can be filtered off without trouble with an ordinary filter.

EXAMPLE 1.

40 gr. of ground coffee are intimately mixed with 5 gr. of finely granulated activated carbon (zinc chloride carbon) which has been rendered completely free of dust and having particles the size of which is from 0.2—0.4 m.m. The fragrant substances are immediately bound on mixing so that the prepared mixture after a few minutes smells only quite weakly of coffee. As is usual in the household when brewing coffee, a small

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quantity of boiling water about 100—200 ccm. is first poured on to the mixture and it is allowed to draw for five minutes. Thereupon the infusion of coffee is diluted in the usual way to 1 litre with hot water until it reaches a drinkable concentration.

This infusion is distinguished by an aromatic and pleasant aroma, and, as compared with a similar infusion without addition of activated carbon, a less bitter taste. The analysis of the infusion of coffee showed that the infusion made with the addition of activated carbon contained about 56% less caffeine than the same infusion made without the addition of activated carbon. In the concentrated residue of the coffee infusion which was treated with activated carbon a diminution of the total nitrogenous content of 43% was attained, from which it is to be concluded that the nitrogenous products of roasting which are evolved during roasting by the conversion of the albumins of the raw coffee beans and which are injurious to digestion are likewise deposited on the activated carbon mixed with the ground coffee.

Further, the analysis of the coffee infusion prepared according to Example 1 in which activated carbon to the extent of $\frac{1}{4}$ of the weight of the ground coffee was added, shows that in the infusion the content of extractive substance is diminished by about 12% as compared with the same infusion without the addition of carbon. In order to prevent as much as possible the deposition of the extractive substances on the added adsorbent it is advisable to treat the adsorbents intended for admixture with the ground coffee with a substance which is readily soluble in water, which can split off when heated and which is indifferent to taste or even pleasant to the taste, for example one which gives a sweet taste to the infusion. The ready solubility in water of the substance intended for treating the adsorbent is necessary in order to bring about during the brewing of the mixture of ground coffee and adsorbent with hot water the quickest possible exchange of the previously adsorbed substance with the nitrogenous constituents, caffeine and roasting poisons which are to be extracted from the coffee. Glycerine, sugar and other carbohydrates soluble in water, such as are also used in the preparation of coffee sweetmeats, are suitable for the preliminary treatment of the adsorbent. The following example shows the advantageous action of an activated carbon previously treated with these substances for the treatment of coffee.

EXAMPLE 2.

40 gr. of ground coffee are intimately mixed with 10 gr. of active carbon, having particles of a size 0.2—0.4 m.m. in which is adsorbed 5 gr of glycerine—that is it is charged with 100% of its own weight of chemically pure glycerine—and brewed according to Example 1, 1 litre of coffee infusion being prepared. This coffee infusion has a somewhat more vigorous taste than the infusion prepared according to Example 1 with carbon which was not previously charged. The analysis of the coffee infusion according to Example 2 showed a higher extraction of the nitrogenous substance than the infusion according to Example 1 and in comparison with an infusion prepared without the addition of carbon a decrease in caffeine of 71% and a decrease in the total nitrogenous content of the concentrated residue of 54% was established. A decrease of the extractive substances of 2% was obtained in comparison with a coffee infusion without the addition of carbon.

The adsorption of the extractive substances can also be reduced by using a carbon which is not too highly activated; for example in place of the zinc chloride carbon mentioned a lower activated carbon prepared by another process may be used. However it is then necessary to increase the quantity of carbon to be added in order to arrive at the same result namely the 70% extraction of caffeine.

The preparation of infusions of coffee and tea having an improved taste from which simultaneously a considerable portion of caffeine or theine and other nitrogenous substances injurious to the consumer have been extracted by intimate mixture of ground coffee and tea with activated carbon or silicic acid, in comparison with known processes of filtering the prepared infusion through layers of adsorbing agents shows considerable advantages which were not to be anticipated even with knowledge of this process. A further advantage of this process resides herein that no particular apparatus is necessary for carrying it out.

The treatment of tea takes place in a similar way to that of coffee. The tea is mixed with activated carbon or silicic acid and then the mixture is allowed to draw in hot water preferably packed in a casing, such as linen sacks, or of perforated metal.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

**POOR
QUALITY**

1. Process for improving the taste of infusions of tea and coffee and for separating out from these infusions distasteful constituents and the constituents which are injurious to the consumer by means of activated carbon or activated silicic acid characterised hereby that the tea or ground coffee is intimately mixed in a dry state with the adsorbent, the mixed substances are allowed to act on one another for a short time and thereupon the mixture is brewed with water, adding at first if desired a small quantity of boiling water and thereupon diluting the concentrated fusion to drinkable strength.
2. Process according to Claim 1 characterised hereby that the activated carbon or silicic acid used in the mixture is previously charged with a non-volatile substance which is easily soluble in water, in particular glycerine, sugar substances and other carbohydrates.
3. The hereindescribed process for treating infusions of tea and coffee.
4. Tea or coffee in packeted form mixed with an adsorbent, as for example activated carbon, as and for the purpose described.

Dated this 1st July, 1930.

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Redhill: Printed for His Majesty's Stationery Office, by Love & Malcomson, Ltd.—1931.